

(which retained their color in preservation), each considerably wider than the interspaces. These bars are usually continuous with their fellows across the back, especially anteriorly; and each narrows and fades ventrally, failing to cross the midventral line; those on the caudal peduncle extend somewhat lower than those on the body. In females the lateral blotches are longer than high and fail to ascend high on the sides. The bands are scarcely in contact with one another along the lateral line in some places; in others the contact is equal to the eye's breadth. The cheeks and lower portions of the opercles were (in life) dull yellowish green. The throats were iridescent with bluish-purple reflections; in preservation they are faintly dusky but less so than the mandibles. Unlike most species of the genus *Hadropterus* there is no trace of a subocular dark bar. A narrow dark band extends forward from the middle of the eye through the nostril, usually joining with that of the opposite side across the frenum. A dark bar extends backward from the eye across the upper part of the cheek to the anterodorsal corner of the opercle. A few dark spots are scattered on the dorsolateral surfaces of the back of the head, and somewhat larger dark spots are present between the lateral bars on the dorsolateral surfaces of the body.

In life the spinous dorsal was light near the base, with a rich chocolate-brown spot on each interradial membrane. This light area was succeeded distally by a dusky band, which shaded gradually into a rich reddish-orange band occupying most of the distal half of the fin, which was sharply and narrowly edged with clear white. In preservation the white edging and the dusky band are evident in the otherwise uniformly faint pigmentation. The soft dorsal was dull orange-yellow, with a narrow light border; a few scattered dark radial spots tend to form rows about one-third and two-thirds of the distance from the base, but in some specimens they are faint or obsolete. At the base of the caudal there are two large light spots (each about size of eye), which were pale yellowish orange in life. Three wavy vertical bars on the caudal are formed by pigment confined to the rays. The caudal, anal, pectorals, and pelvics were suffused with dull yellow in life, and all had light distal edges. In preservation the basal half of the anal is faintly dusky; the pelvics have a few median dusky spots; and each pectoral has a narrow curved bar just proximad of the middle.

The color description given above was drawn from the Georgia specimens. Juveniles from Saugahatchee Creek, Ala., vary greatly in body pattern. Some differ but little from the adults, whereas others are heavily and irregularly mottled with dark on the sides and the lateral series of blotches are scarcely or not at all developed.

Habitat.—The Etowah River is an upland stream (elevation at site of collection about 1,300 feet), which at the time of the collection was clear, colorless, cool (67° F.), and with a moderate to swift current. It varied from about 35 to 60 feet in width, and the flow, estimated at 250 cubic feet a second, was somewhat greater than normal owing to recent rains. The bottom was composed largely of sand, with coarse gravel and slab-rubble riffle areas. Vegetation was limited to slight algal growth on the stones.

All the specimens of *H. palmaris* were taken on a swift riffle, which was about 6 feet long and extended the width of the stream. It varied from a few inches to over a foot in depth. Common associates of *H. palmaris* on the riffle were *Poecilichthys jordani* and *Cottus zopherus* (probably this species although

the lateral line is nearly or quite complete). Other species taken in the collection were *Moxostoma* sp., *Hypentelium etowanum*, *Notropis callistius*, *N. x. xaenocephalus*, *N. trichroistius*, and *Micropterus coosae*. Local residents reported that rainbow trout occurred in the stream, but none were collected. No habitat data are available for the Alabama collections.

Relationships.—*H. palmaris* differs trenchantly from all other known species in the genus in coloration and color pattern; especially distinctive are the pattern of the spinous dorsal, the uniform absence of a subocular bar, and the presence of dark spots on the anterior back and of two round light spots at the base of the caudal. It differs from *macrocephalus*, *phoxocephalus*, and *oxyrhynchus* especially in the blunter snout, the shorter distance from the tip of the snout to the union of the gill membranes (see Hubbs and Raney, loc. cit.), and in the larger scales. In its entire preopercle, *palmaris* contrasts with *H. scierus*. The Atlantic drainage species, *pellatus* and *roanoka*, differ from *palmaris*, among other respects, in the larger scales and in the absence of scales on the nape. *H. maculatus* and *H. palmaris* are quite similar in form, although in *maculatus* the soft dorsal and anal are much lower, but *maculatus* typically lacks scales on the predorsal area, and has more perfectly scaled opercles than *palmaris*. On the basis of color pattern *H. palmaris* is separable at a glance from *H. nigrofasciatus*, the only other described species of the genus from the Alabama basin. It also differs from that species in the imperfect squamation of the opercles, the much larger and more specialized midventral scales of the males, and in the stronger fin spines, especially the first anal spine. Although *palmaris* lacks the characteristic subocular dark bar of *evides*, the two species share certain features of coloration. Both have paired light spots at the base of the caudal, lateral blotches which are similar in shape and color and agree in continuing upward to cross the back, and each is highly colored in life. *H. evides* is a heavier and more robust species, and in it the spinous dorsal is conspicuously higher and more rounded, and the soft dorsal lower than in *palmaris*. The absence of cheek scales in *evides* and the imperfect squamation of the opercles in *palmaris* are clear-cut differentiating features.

H. palmaris seems to share more similarities with *evides* than with other species, the two apparently standing somewhat apart from the remaining species in the genus.

ICHTHYOLOGY.—*The remora Phtheirichthys lineatus and the first specimen from United States waters.*¹ HUGH M. SMITH, U. S. National Museum.

In the year 1791 there appeared two descriptions of a new remora called *Echeneis lineatus* by Archibald Menzies in Transactions of the Linnean Society, London (vol. 1, p. 187, pl. 17, fig. 1), and *Echeneis tropica* by Bengt Anders Euphrasén in Kongliga Vetenskaps Akademiens Nya Handlingar, Stockholm (vol. 12, p. 317). The habitat of *E. lineata* was stated to be the Pacific Ocean between the tropics, and the single specimen 5 inches long on which the description was based was found adhering to a turtle. For *E. tropica* the locality given was latitude 2° 9' N., longitude 20° 49' W. from Paris, a place in the Atlantic Ocean about 600 miles southwest of that part of Africa now known as Liberia, and the single specimen mentioned was discovered attached to the nautical log of a ship when the log was pulled aboard.

These two names have generally been regarded as applying to the same species, and there is certainly nothing in the original descriptions to indicate specific distinctness. The outstanding character is the possession of only 10 laminae in the cephalic disk, combined with features that are shared with the common remora *Echeneis naucrates*, such as the very elongate body, ventral fins narrowly adnate to the abdomen, angulate pectoral fins, middle caudal rays produced in the young, and strongly projecting lower jaw with a cutaneous symphyseal flap. In 1862 Gill (Proceedings of the Academy of Natural Sciences of Philadelphia) created the genus *Phtheirichthys* and designated *Echeneis lineata* Menzies as the type.

With two specific names for the same fish coming into use in the same year, there arises the question of the proper one to adopt. While the question may not be definitely settled by the internal evidence afforded by the respective publications, there is ground for a reasonably satisfactory decision affecting both priority and convenience.

The Nya Handlingar in which Euphrasén's *Echeneis tropica* was described (in a paper entitled "Scomber atun och Echeneis tropica beskrisne") was issued in quarterly parts with consecutive pagination, the paper appearing in the part for October, November, and December 1791. It is improbable that the part was printed and distributed before the last quarter of 1791; it is possible that it was not issued until the last month of that quarter or even the beginning of the next quarter.

¹ Published by permission of the Secretary of the Smithsonian Institution. Received September 25, 1940.